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ABSTRACT

This pamphlet presents worksheets for use in fifteen activities or groups of activities designed for teaching the metric system to children in grades K through 6. The approach taken in several of the activities is one of conversion between metric and English units. The majority of the activities concern length, area, volume, and capacity. A bulletin board idea for introducing the Celsius scale is included. In addition to the worksheets, the pamphlet includes a brief history of the metric system and rationale for the United States' adoption of it, and a list of materials and audio-visual aids available to teachers in the San Diego City Schools. (SD)

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SAN DIEGO CITY SCHOOLS
PROGRAMS DIVISION
INSTRUCTIONAL SUGGESTIONS BULLETIN

METRIC ACTIVITIES, GRADES K-6

Compiled by Bob Draper

TABLE OF CONTENTS

Introduction 1
Brief History of the Metric System 2
Metric Supplies and Materials 4

Activities

Length--Body Measure 5
About Me 6
Centimeters and Inches 9
A Measuring Encounter 12
Square Centimeters 13
Centimeter Graph Paper (Master) 16
Volume in Cubic Centimeters 17
Capacity (Liquid Measure) 21
Metric Is a Two-Syllable Word (Elementary Language Arts) . 24
Puzzles and Codes 26
Bulletin Board Ideas 38
Phrases and Cliches Gone Metric 40
All You Will Need To Know About Metric 41

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INTRODUCTION

This Instructional Suggestions Bulletin is intended to give teacher and students activities to use during Metric Week, March 17-21, 1975. The activities encourage the use of the metric measuring devices contained in the metric kit, and were developed and compiled by members of the resource staff in the Programs Division for teachers and students. It is also hoped that this kit will be used throughout the year to increase the awareness of the metric system and its practical applications to the world we live in, as well as to highlight "Metric Week."

One of the most efficient methods of learning to measure in the metric system is to provide opportunities for students actually to measure, using the different activities and materials in this metric kit.

This Instructional Suggestions Bulletin contains material on linear measurement, area measurement, and volume and liquid measurement; interdisciplinary activities including puzzles and codes; and bulletin board ideas. (The puzzles are from Minneapolis Public Schools; the bulletin board ideas are from *A Metric Workbook for Teachers of Consumer and Homemaking Education*, published by the Orange County Department of Education.)

The linear measurement activities begin at primary level using non-standard measures and provide an opportunity for the students to discover, through a discussion of the differences in their measurements, a need for standard measuring units. These activities increase in difficulty level to discovering relationships in measurements of different parts of the body.

The area, volume, and liquid measurement activities are generally more suitable for students in intermediate and upper elementary grades.

BRIEF HISTORY OF THE METRIC SYSTEM
AND PARTIAL RATIONALE FOR CONVERSION

Emerging nationally in France in 1791, the metric system of measurement began its sweep of the world until, by 1965, the United States remained the only major nation not using the metric system or committed to conversion to its use. Most of us are aware that our change to the metric system is coming. It has, in fact, already been taking place slowly.

The economic impact of our holdout is dramatically obvious. A considerable portion of United States products are unsuitable for the metric world market, a fact that costs us $20 billion a year in export losses alone! It may have been this reality that inspired Congress in 1968 to direct the Department of Commerce to explore the feasibility of United States conversion to metric. When the Department of Commerce directed a study of the problem to the Bureau of Standards, the Bureau concluded that the rate at which the United States was already going metric on its own accord implied that it was just a question of time until the country is entirely metric. As a result of the Bureau's recommendations, the Senate passed the Metric Act of 1972 which instructed the President to appoint a board to plan a ten-year conversion program.

While the citizenry awaits the mandate, progress continues but is slow. A review of the status of legislation indicates that the overall metric bill is slated to be resubmitted in the 1975 session of Congress.

It is easy to understand why educators welcome metrication. Its outstanding advantage is the simplicity of teaching and learning how to measure and to convert between units within the system. Time saved as a result of the more easily understood metric system could be spent on other areas of learning. For example, much drill in fractions might be diminished even after attaining an easy familiarity with the common halves, thirds, fourths and fifths.

Metrication could provide an ideal opportunity for reforms in curriculum which some teachers feel are much needed. To be considered might be:

-Earlier introduction of decimal fractions with parallel reinforcement of place value.

-A significant decrease of emphasis on skills in manipulating fractions.

The changes brought about by metrication will bring problems. The cost of implementation will be staggering. Lest we let that thought overwhelm us, however, let us consider that the expense (losses) of not converting could be many times greater. And, of course, the expense will be distributed over a ten-year period.

In worldwide use since 1840, the metric system qualifies as a reasonably mature idea. The proposal that the United States "go metric" is nearly as old as the republic. Our time has come!

The amount of new knowledge is actually quite small, which may suggest that success in making the change will depend on the degree to which we provide appropriate experiences for maximum development of understanding. Some guidelines to consider for that goal might be:

1. Teach students to THINK METRIC.

2. Concentrate on practice with those units which are utilitarian.

3. Minimize conversions. Do not involve students or parents in a morass of conversion from the metric to the English (American) system or vice versa.

4. Use metric measure at every possible opportunity including all subject matter areas. Math teachers, teach metric as exclusively as possible and provide in-service materials for your colleagues in other subject matter fields.

Metrication is here! The question is not IF, but HOW.

METRIC SUPPLIES AND MATERIALS

STOCK ITEMS

29-R-5945	Opaque Ruler, Plastic, 6-inch, English and Metric Scales		Dz	.88
29-R-5950	Maple Ruler, Wood, 12-inch, English One Edge--Metric (Millimeter) One Edge		Ea	.05
29-M-3750	Meter Stick, Maple		Ea	.68

Beakers

29-B-5739	Beakers, Graduated, Polypropylene 50 ML	(25)	Pkg	.78
29-B-5741	Beakers, Graduated, Polypropylene 100 M	(25)	Pkg	1.09
29-B-5745	Beakers, Graduated, Polypropylene, Separate Scales to 7 oz and 210 cc	(25)	Pkg	1.29
29-B-5747	Beakers, Graduated, Polypropylene 250 ML (1/4 liter)	(25)	Pkg	1.83
29-B-5749	Beakers, Graduated, Polypropylene 400 ML	(25)	Pkg	2.27

AUDIO-VISUAL MATERIALS AVAILABLE NOW AT INSTRUCTIONAL MEDIA CENTER

FILMS:

"Linear Measurement" (Col, 10 min)

"Metric America" 563015
Excellent film to use for parents' meeting, staff introduction to the metric system and in the classroom.

SOUNDSTRIPS:

Ss 389.152 "A Metric America"
Six filmstrips w/cassette tapes, accompanied by 27 activity cards. Filmstrip introduces the metric system and demonstrates the measuring of length, volume.

Ss 389.152 "The Metric System - The Universal Language of Measurement"
Six filmstrips w/cassettes covering an introduction to the metric system; measuring length, area, volume, mass, capacity.

Ss 389.152 "Metric Weights and Measurements"

2x2 389.152 "Think Metric: Understanding and Using the Metric System"
(80, Color, Manual)

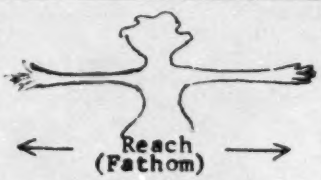
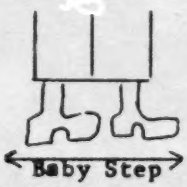
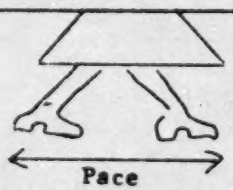
FILMSTRIP:

Fs 389.152 "Metric System" (39 Fr, Manual)

LENGTH -- BODY MEASURE

Arms, Hands and Finger

What are you measuring?

	Esti-mate	Mea-sure-ment
Digit		
Palm		
Span		
Cubit		
 Reach (Fathom)		
 Baby Step		
 Pace		

Relationships between Body Measures
How many digits make a palm? _____
How many palms make a span? _____
How many palms make a reach? _____
How many baby steps make a pace? _____
_____ palms make a pace.
_____ spans make a pace.
How many digits make a cubit? _____
How many palms make a cubit? _____
WHAT ELSE CAN YOU FIGURE?
WHAT PATTERNS CAN YOU FIND?

For each, decide which body measure you will use. Then estimate, and then measure. (Could you use a combination of body units to measure more accurately?)

	What will you use?	Esti-mate	Measure-ment
Distance across the room			
Width of book			
Length of chalk-board			
Width of door			
Length of table			
Width of window			
Shadow of your smile			

NAME _____ GRADE _____ AGE ____ DATE _____

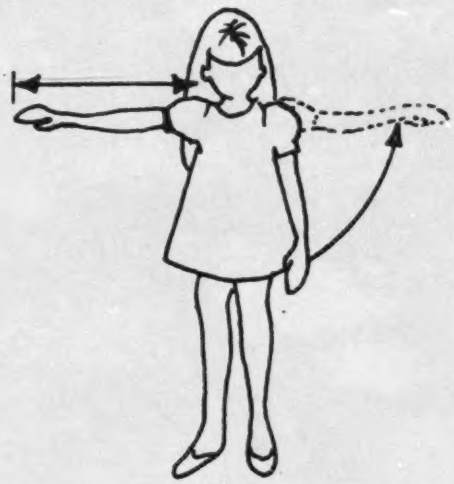
BOY _____ GIRL _____

ABOUT ME

Using the meter measurer and a long piece of string, you and your partner are to help each other to get as many of your measurements as you can.

How tall are you?

_____



How long is your arm? _____

What is the measurement of both arms? _____

What is the measurement around your chest? _____

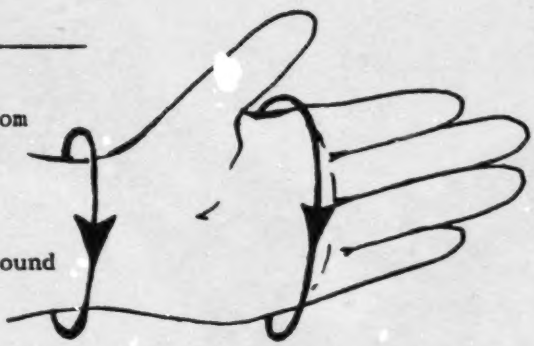
Around your waist? _____

What is the length of your shoe? _____

Take a step. Measure the distance from one toe to the other. _____

Have your partner place the string around your head. What is the measurement?

_____



Distance around the palm. _____

Distance around the wrist. _____

Length of middle finger. _____

Other measurements

_____ _____

_____ _____

_____ _____

8

A B O U T M E

MY NAME IS _____ GRADES 1, 2, 3

I AM _____ YEARS OLD.

MY HEIGHT IS _____CENTIMETERS.

MY FEET ARE _____CENTIMETERS LONG.

MY HAND MEASURES_____CENTIMETERS AROUND.

ON THE PLAYGROUND

I CAN THROW A BALL _____METERS.

I CAN JUMP _____CENTIMETERS.

I CAN DO A RUNNING JUMP FOR _____CENTIMETERS.

I CAN THROW A BEAN BAG _____METERS.

I CAN TAKE A GIANT STEP _____CENTIMETERS LONG.

MY NORMAL STRIDE IS _____CENTIMETERS..

THINGS AROUND ME IN SCHOOL

MY CHAIR IS _____CENTIMETERS FROM THE FLOOR.

MY DESK IS _____CENTIMETERS FROM THE FLOOR.

MY DESK IS _____CENTIMETERS LONG AND _____CENTIMETERS WIDE.

MY FAVORITE BOOK IS _____CENTIMETERS LONG AND _____CENTIMETERS WIDE.

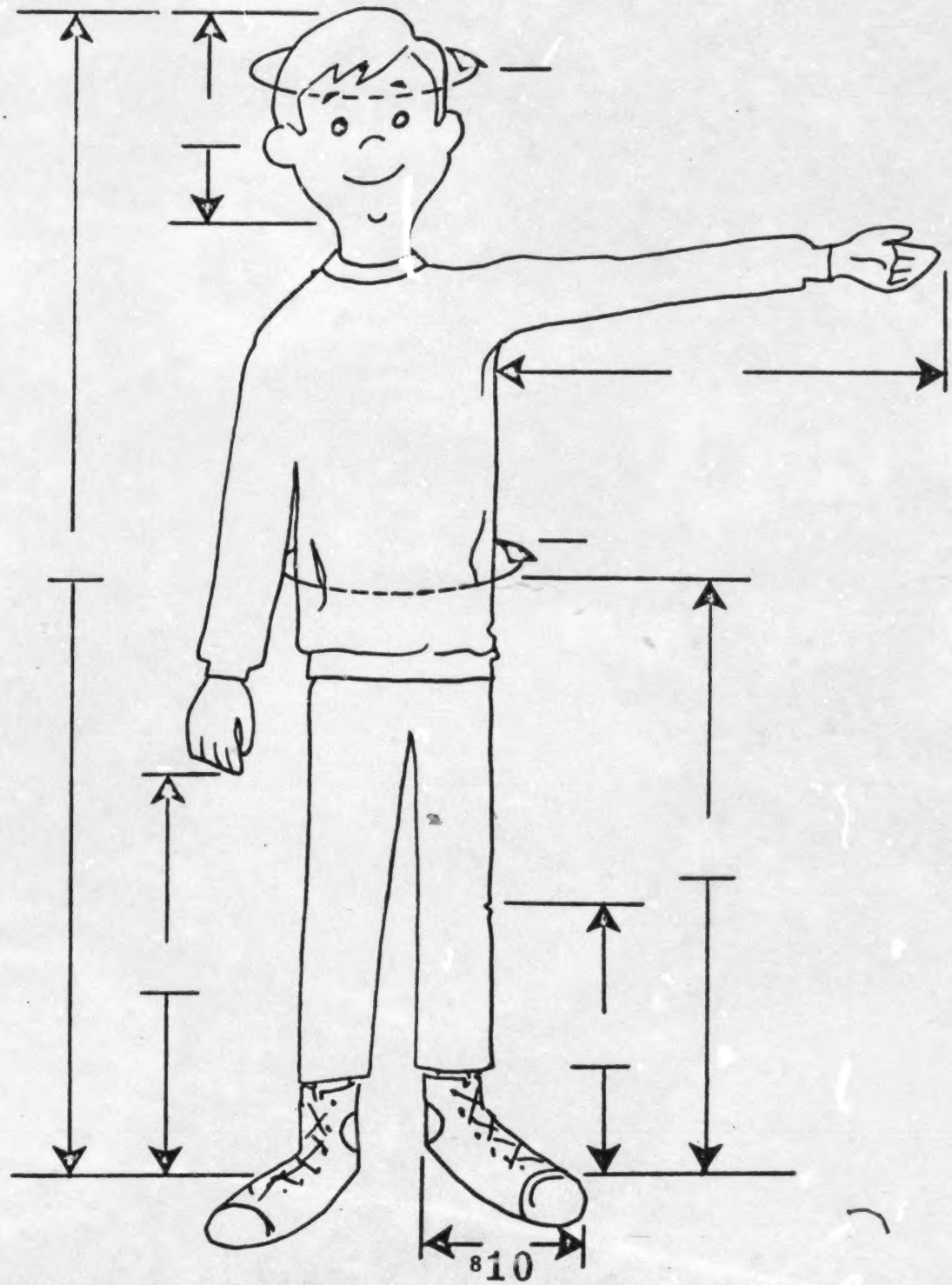
MY FRIEND IN CLASS IS _____CENTIMETERS TALL.

NAME _____ GRADE _____ AGE _____ DATE _____

BOY _____ GIRL _____

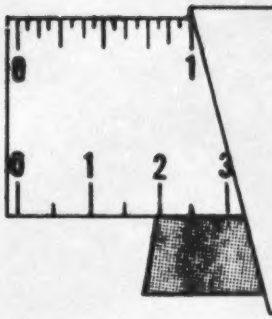
ABOUT ME

Using a meter stick and a piece of string, complete the diagram with your own measurement statistics.



NAME _____ GRADE _____

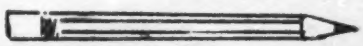
CENTIMETERS AND INCHES



Place a piece of paper over the ruler so that it just covers the one-inch mark. How many centimeters does it take to make one inch?

_____ centimeters equal 1 inch

MEASURE ALL ITEMS IN BOTH INCHES AND CENTIMETERS

OBJECT	IN INCHES	IN CENTIMETERS
 PENCIL		
CRAYON		
SPOON		
FINGER		
SHOE		
BOOK—LENGTH WIDTH		

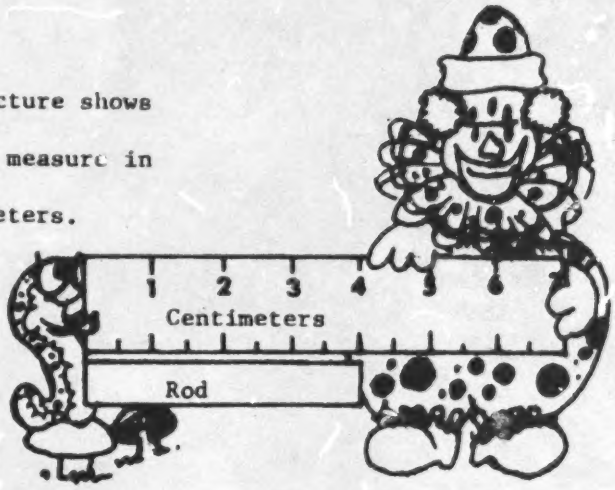
11

NAME _____ GRADE _____

CENTIMETERS

The CENTIMETER is a unit of length.

The picture shows how we measure in centimeters.



The rod is _____ centimeters long.

How long is the centimeter ruler? ☐ centimeters

How many centimeters in each line segment?

A ———————————

B ——

C ——————————————————

☐ centimeters

☐ centimeters

☐ centimeters

D

☐ centimeters

E

☐ centimeters

Use your centimeter ruler to draw these line segments:

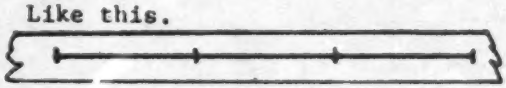
2 centimeters long

9 centimeters long

5-1/2 centimeters long

3-1/2 centimeters long

Mark off every two centimeters on this line segment. Like this.



———————————————————————

How mary 2-centimeter segments do you count? ☐

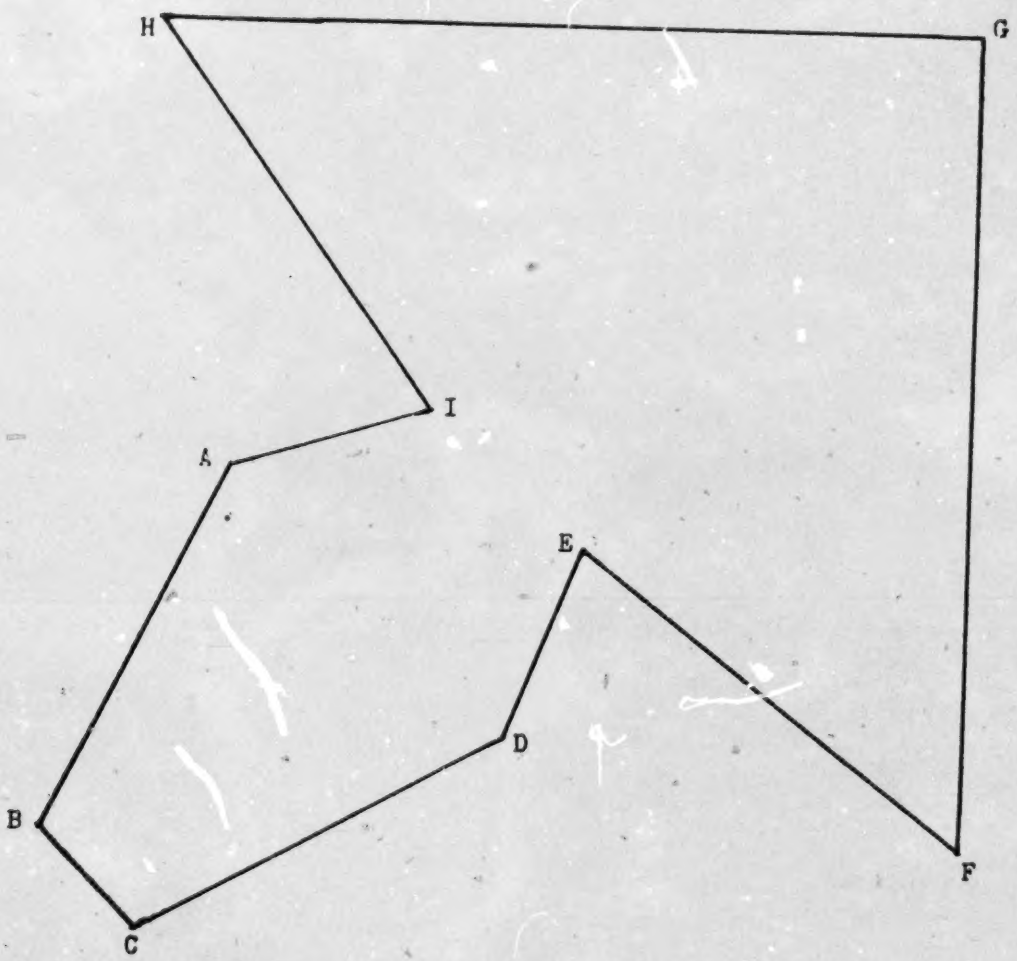
How much of a segment is left over? ☐

NAME _____ GRADE _____

CENTIMETERS

Measure the line segments in centimeters.

Write the numeral on each _____.



$m(\overline{AB})$ = _____ $m(\overline{BC})$ = _____ $m(\overline{CD})$ = _____

$m(\overline{DE})$ = _____ $m(\overline{EF})$ = _____ $m(\overline{FG})$ = _____

$m(\overline{GH})$ = _____ $m(\overline{HI})$ = _____ $m(\overline{IA})$ = _____

$m(\overline{AB}) + m(\overline{BC})$ = _____ $m(\overline{EF}) + m(\overline{FG})$ = _____

A MEASURING ENCOUNTER

Materials: One piece of string and a centimeter measure - or a centimeter tape and one partner (any size).

Purpose: To use the string to discover relationships between different parts of your body, for example: thumb to wrist, wrist to neck, and so on.

Activities (Make the following measures to the nearest centimeter.):

1. Is twice around your thumb equal to once around your wrist?

2. Twice around your wrist is equal to once around neck?

3. _____ around your neck is _____ around wrist.

4. How many wrists to make an ankle?

5. How does distance around your head compare with the distance around waist? (2 to 1) or (3 to 1)

6. Measure as many other people's height and waist sizes as possible. Keep a record of your results.

   What did you find? $\frac{\text{Height}}{\text{Waist size}} = \frac{3}{1} \; ? \; \frac{2}{1} \; ? \; \frac{4}{1}$

7. What is the relationship of your reach to your height?

8. What other relationships can you find? Keep a record and report your results.

9. How does the perimeter (length around) of your hand compare to the length of your arm? The length of your leg? To other parts of your body? Discuss your findings with two other people. What did you find out?

_____

_____

_____

_____

10. Compare the relationship between the shoe size and height of several people. What did you discover?

11. Do short people walk slower than tall people? What kind of an activity would help you find this out?

12. Is there a relationship between the length of your foot and the length of your hand?

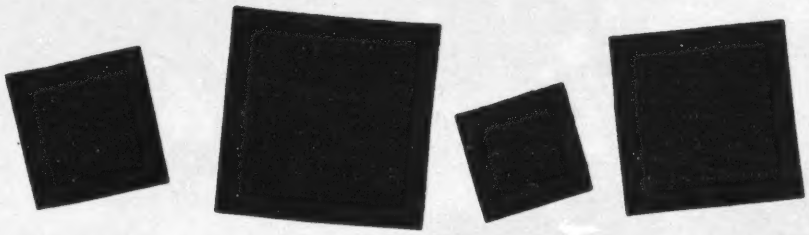
13. Is the span of your hand the same as the length of your foot (heel to little toe)?

NAME _____

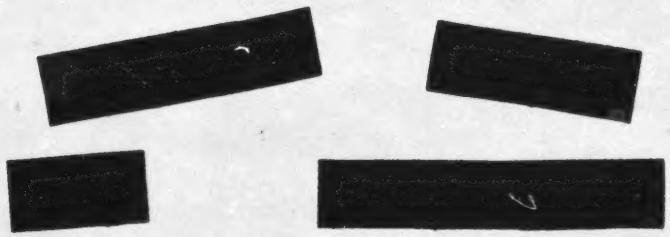
SQUARE CENTIMETERS

1. Circle the square which is one square centimeter in size.

2. Circle the square which is four square centimeters in size.



3. Circle the bar which is two centimeters long.

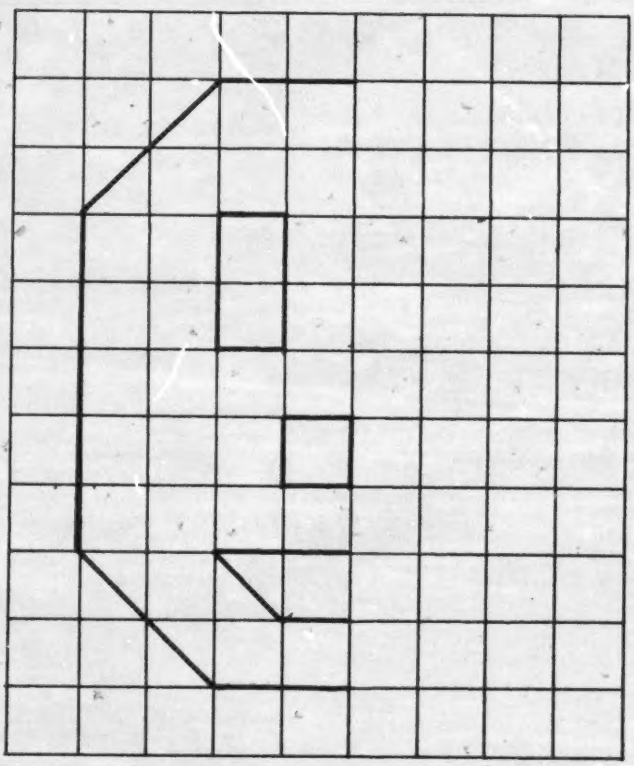


4. Complete the face in the diagram.

How many square centimeters make the nose? _____

How many square centimeters make the mouth? _____

How many square centimeters make the eyes, nose and mouth? _____



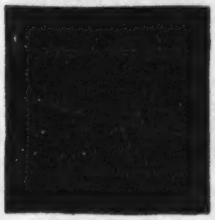
15

SQUARE CENTIMETERS

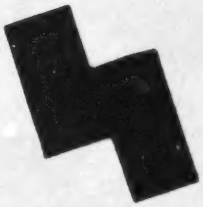
Can you count the number of square centimeters in each of the patterns using the centimeter grid?

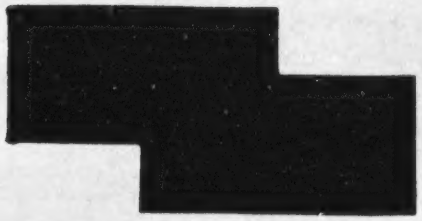
A

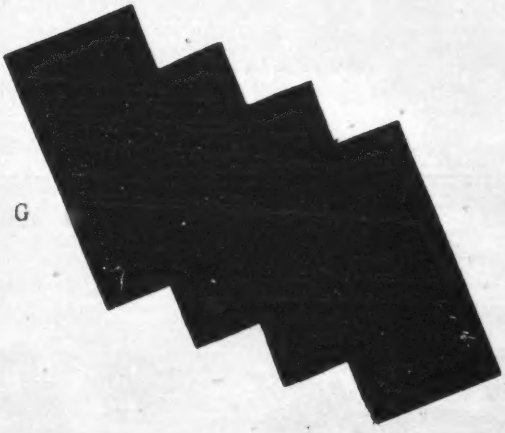
B

C 

D

E 

F 

G 

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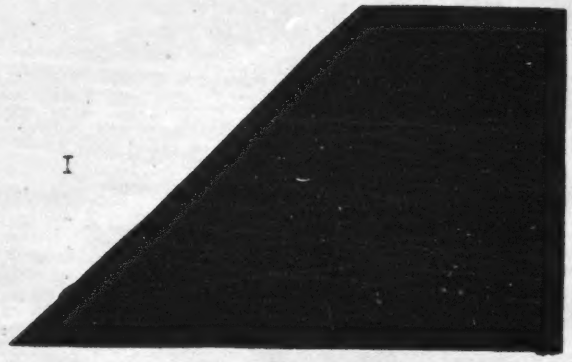
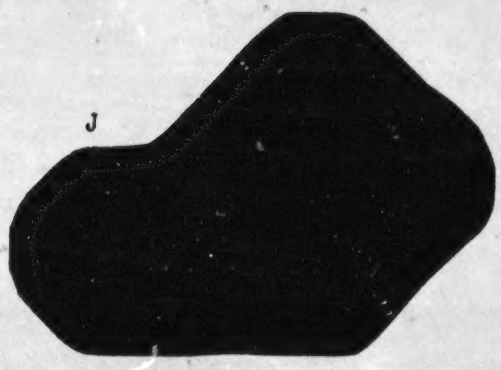
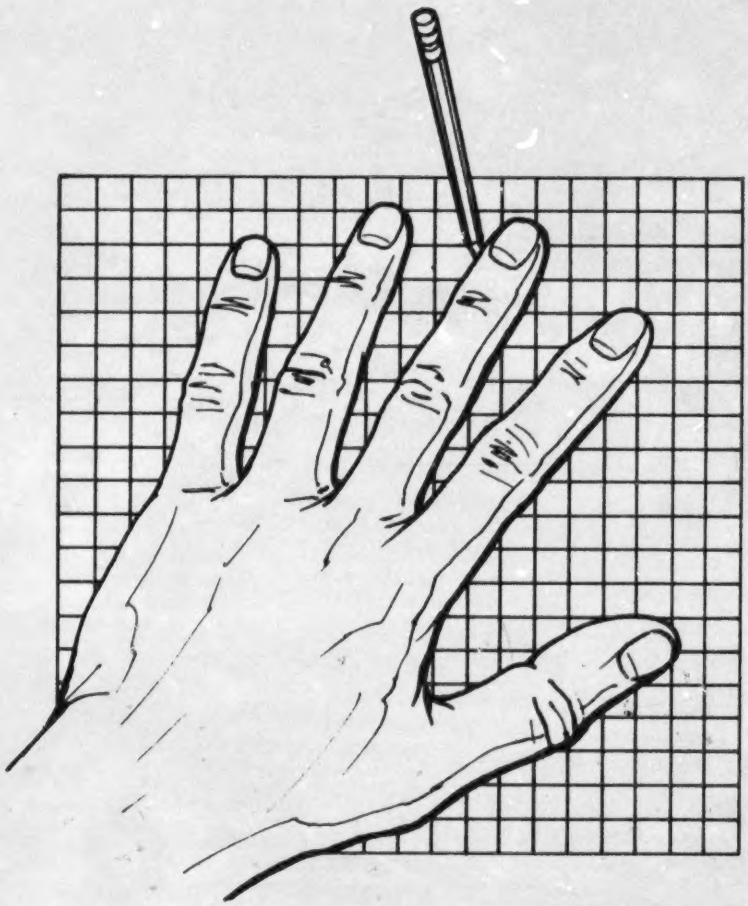
I 

J 



EXPERIMENT **Apparatus: Meter Stick and Paper**

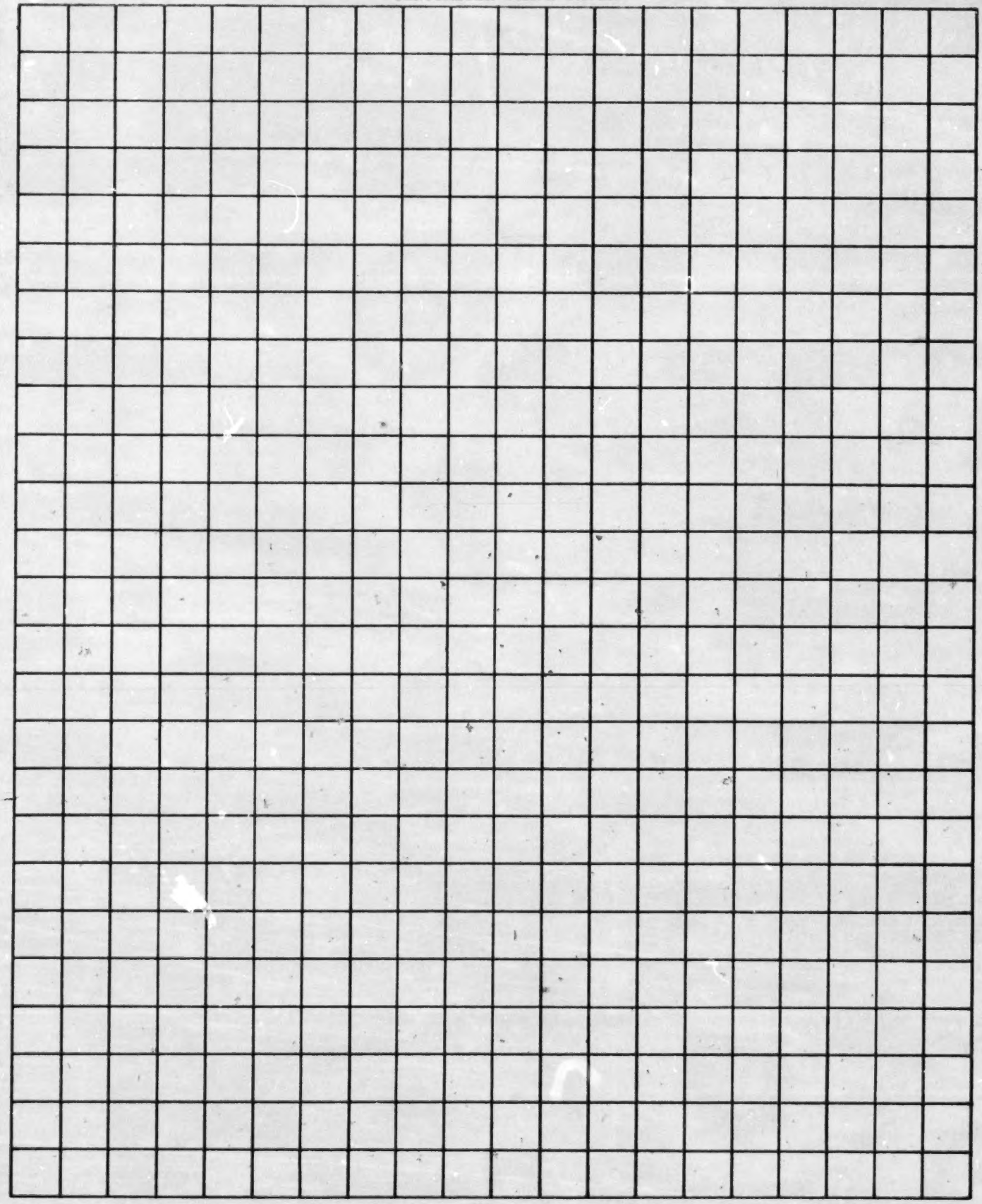
1) Make a 100 cm X 100 cm graph paper using your meter ruler.
2) How many square centimeters in one square meter (1 meter by 1 meter square)?
3) Find out how many square centimeters of skin you have on the outside of your body by placing this square all over you.

EXPERIMENT **Apparatus: Centimeter Ruler and Paper**

1) Get hold of 5 different leaves and outline them on a 20 cm X 20 cm graph paper.
2) By counting squares find their size.

Reprinted from *Introducing the Metric System with Activities* by Donald Buckeye. (Troy, MI: Midwest Publishing Co.).

CENTIMETER GRAPH PAPER



VOLUME IN CUBIC CENTIMETERS

STUDENT ACTIVITY--VOLUME

1. Assemble by cutting, folding, and pasting, figures A, B, C and D into cubes.

2. What would be the volume of each of the four figures if they were completely solid?

   (Note: Each square unit is a cubic centimeter.)

   Record your findings on the following chart:

FIGURE	VOLUME IN CUBIC CENTIMETERS
A	
B	
C	
D	

3. Which figure has the largest volume? _____

4. Which figure has the smallest volume? _____

5. Try making some cubes of your own. What are the volumes of your cubes?

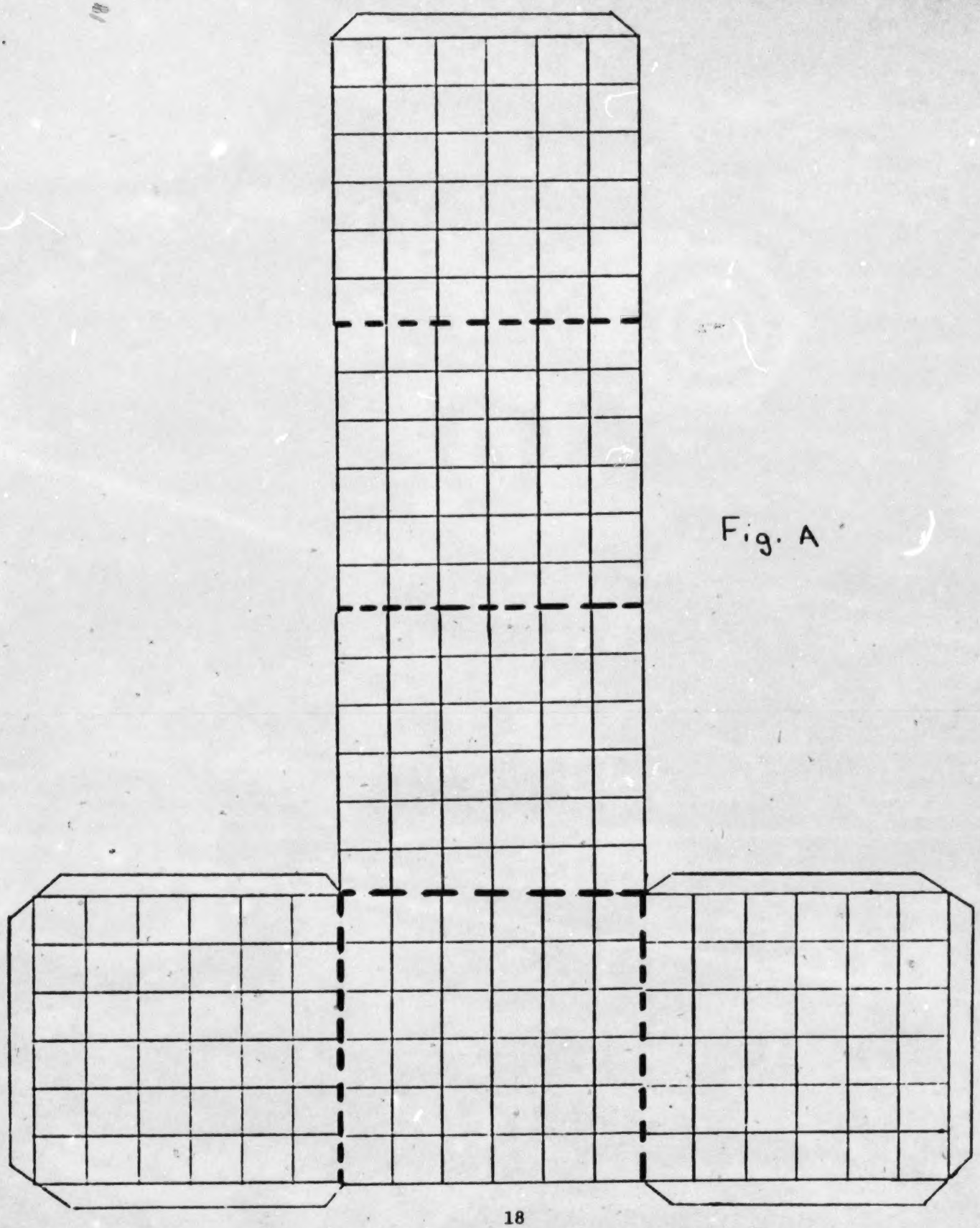


Fig. A

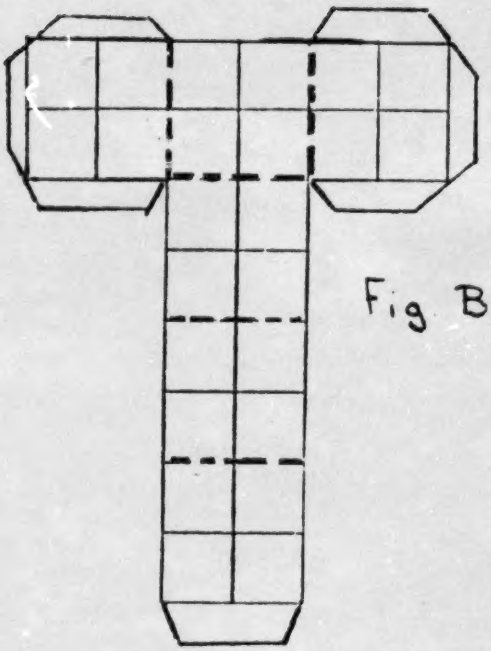


Fig B

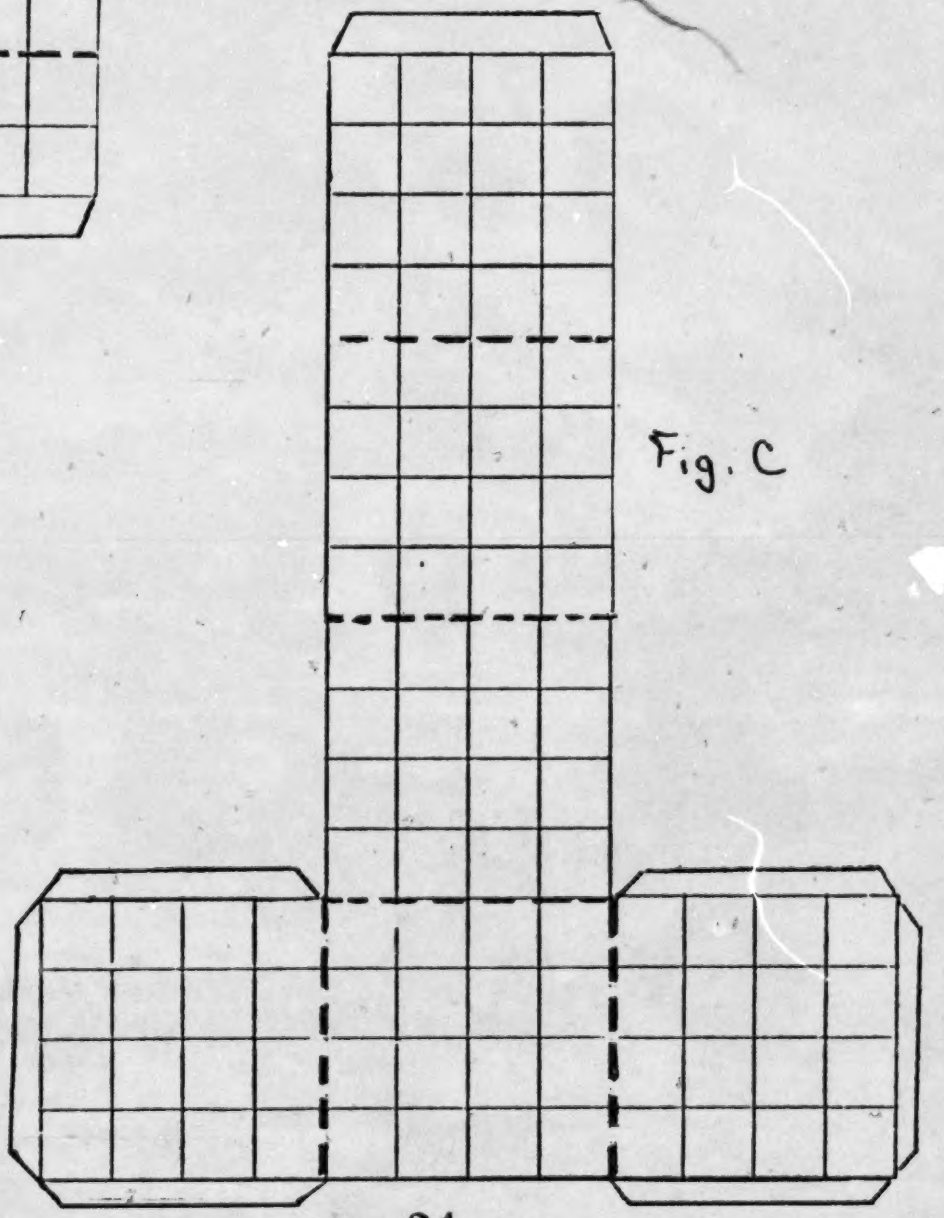


Fig. C

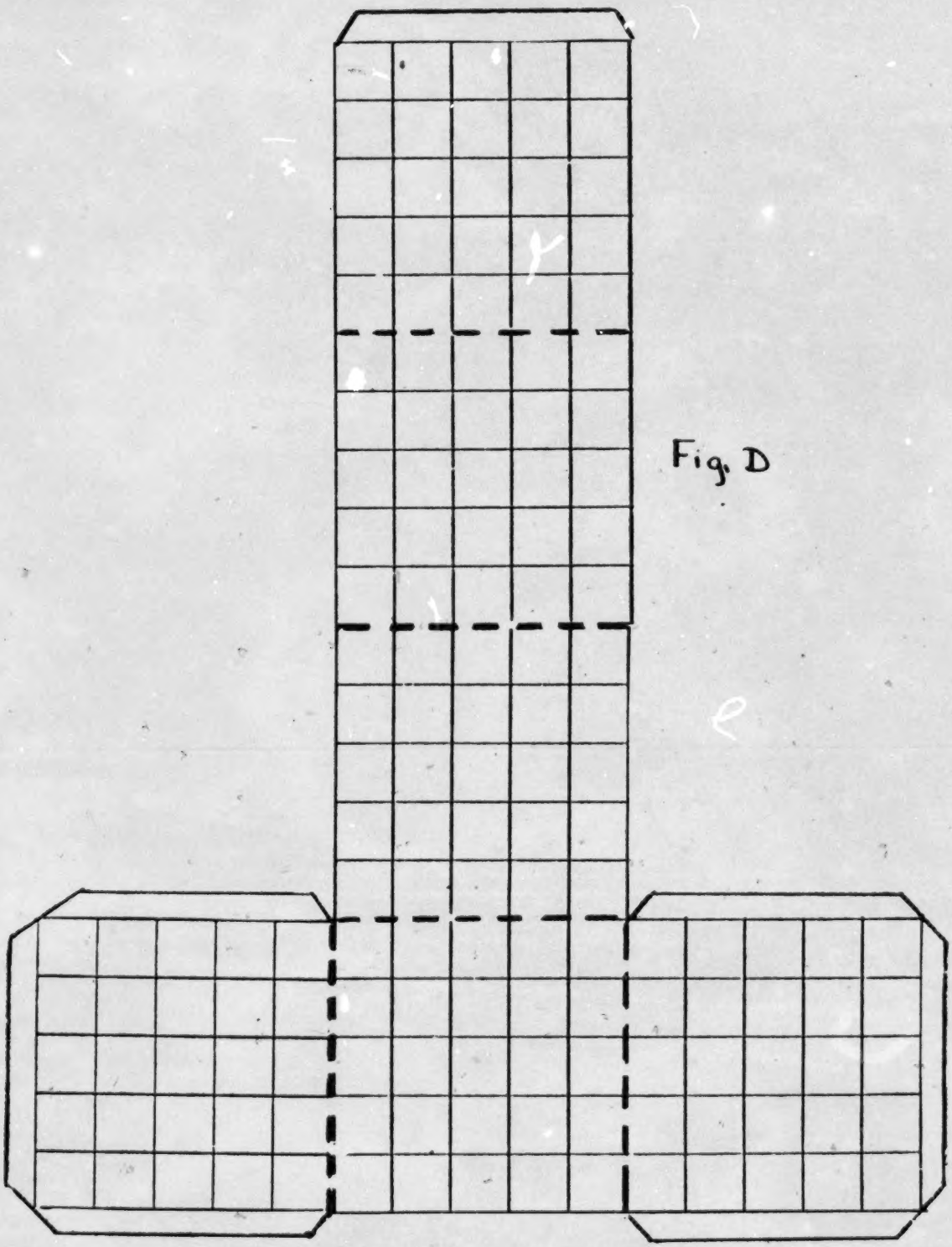


Fig. D

22

CAPACITY (LIQUID MEASURE)

TEACHER'S GUIDE TO STUDENT ACTIVITY--Liquid Measure

Student Activity Objective:

1. At the conclusion of this activity, each participating student will be able to determine the volume of at least five containers using liters and milliliters.

2. At the conclusion of this activity, each participating student will begin to develop an intuitive awareness of the size of a liter and a milliliter.

Materials Needed for Activity:

Student Activity Sheet #1 for each participating student (See next page.)
Milk cartons
Beaker graduated in milliliters
Water
Containers labeled 1-5

Vocabulary for Student Activity:

liter

beaker

milliliter

graduated

Developing the Activity and Related Concepts:

1. A liter is equivalent to about 1 quart, 3 ounces. The students may make their own liter measure by using a quart milk carton. The carton should be opened completely at the top; 1,000 milliliters may then be added to the container and the waterline marked.

2. The students may use the beakers graduated in milliliters and their liter (milk carton) to measure the capacity of the containers.

3. Choose five containers (different size bottles) and label with the numbers 1-5.

4. You may wish for the children to work in five groups to do this activity. Another alternative would be for this activity to be set up at a math center as an independent exploration.

STUDENT ACTIVITY #1

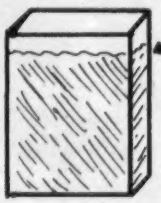
Liquid Measure

1. The basic metric unit of measure for measuring liquids is the liter. The liter is a little larger than a quart.

quart

liter

For this lesson, you will first need to make your own liter measure from a quart milk carton. Since there are 1,000 milliliters in a liter, use a beaker graduated in milliliters to carefully add 1,000 milliliters to the milk carton. Mark the waterline on the carton. Now, you will have one liter every time liquid is placed in the carton up to this line.



Waterline: 1,000 milliliters

2. Find the capacity of each of the containers that your teacher will give you. Record your answers in liters and milliliters on the graph below.

Container	Capacity
1	
2	
3	
4	
5	

Answers will vary with size of containers.

24

INDEPENDENT EXPLORATION

(Liquid Measure)

1. Find the capacity of each of the containers on the chart below. You will need to use a beaker graduated in milliliters. Record your answers on the chart in milliliters.

Container	Capacity
1/4 tsp.	
1/2 tsp.	
1 tsp.	
1 tbsp.	
1/4 cup	
1/2 cup	
1 cup	

2. Can you find the capacity of other containers? Record your findings.

ELEMENTARY LANGUAGE ARTS

METRIC IS A TWO-SYLLABLE WORD

The activities listed below are suggestions to assist the teacher in planning for "Think Metric Week" and are probably most suited to students who are working at levels 3-6.

1. Introduce the term *metric system* and its appropriate vocabulary.

   a. Provide background information from available sources

   Available at IMC:
   - Film: "Linear Measurement"
   - Soundstrips: Ss 389.152 Metric Weights and Measurements
     Ss 389.152 Introducing the Metric System

   b. Display and discuss the metric ruler.

2. Compare our customary system of measurement with the metric system, stressing the complexity of our system as compared to the more simple metric system.

3. Substitute metric vocabulary for the weekly spelling list, or include some of the metric vocabulary as bonus words.

4. Prepare a list of metric terms and ask students to underline the prefixes with one color and the suffixes with another color.

hectogram	centigram	kilogram	dekagram	milligram	decigram
hectometer	centimeter	kilometer	dekameter	millimeter	decimeter
hectoliter	centiliter	kiloliter	dekaliter	milliliter	deciliter

   Another approach would be to supply the words *gram*, *liter* and *meter* and ask students to add the prefixes hecto, centi, kilo, deka, milli, and deci.

5. Encourage students to conduct a kitchen search and check all food labels for metric measurements; record findings and share with the class.

6. Suggest that students collect pictures from magazines, newspapers, catalogs, and other sources to show examples of items that have metric measures. A bulletin board might be displayed using the pictures collected.

7. Give students four cards and ask them to write the words liters, grams, meters and celsius. The teacher prepares a statement which will require a card response. When the statement is read, students will display the appropriate card.

   EXAMPLE: Using the metric system, pounds of potatoes would be measured in _____. (Students will display the card for grams.)

8. Give students a list of scrambled words using the metric vocabulary, and ask them to arrange the words in their proper order.

   To increase interest: Divide the class into two teams and have them compete for points by unscrambling the words. The words may be written on the board or prepared on cards.

9. Design a metric search puzzle similar to the one below.

K	C	E	L	S	I	U	S
X	I	O	L	I	T	E	R
M	I	L	L	I	M	V	C
Y	N	T	O	M	E	P	E
D	E	K	A	G	T	C	N
H	M	E	T	E	R	S	T
Z	W	D	E	C	I	A	I
H	E	C	T	O	C	R	M

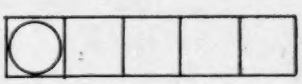
   The metric terms below are hidden in the puzzle. Circle each term you find.

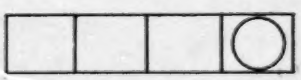
CELSIUS	DECI	HECTO	LITER	METRIC
CENTI	DEKA	KILOGRAM	METERS	MILLI

   To make the search more challenging to older children, omit the words under the puzzle and ask the students to find the ten metric terms.

10. Design "jumbles" similar to the one below.

    Directions: Solve the jumble by unscrambling the metric terms and arranging the words in their proper order.

    COTHE  TRILE

    LOIK 

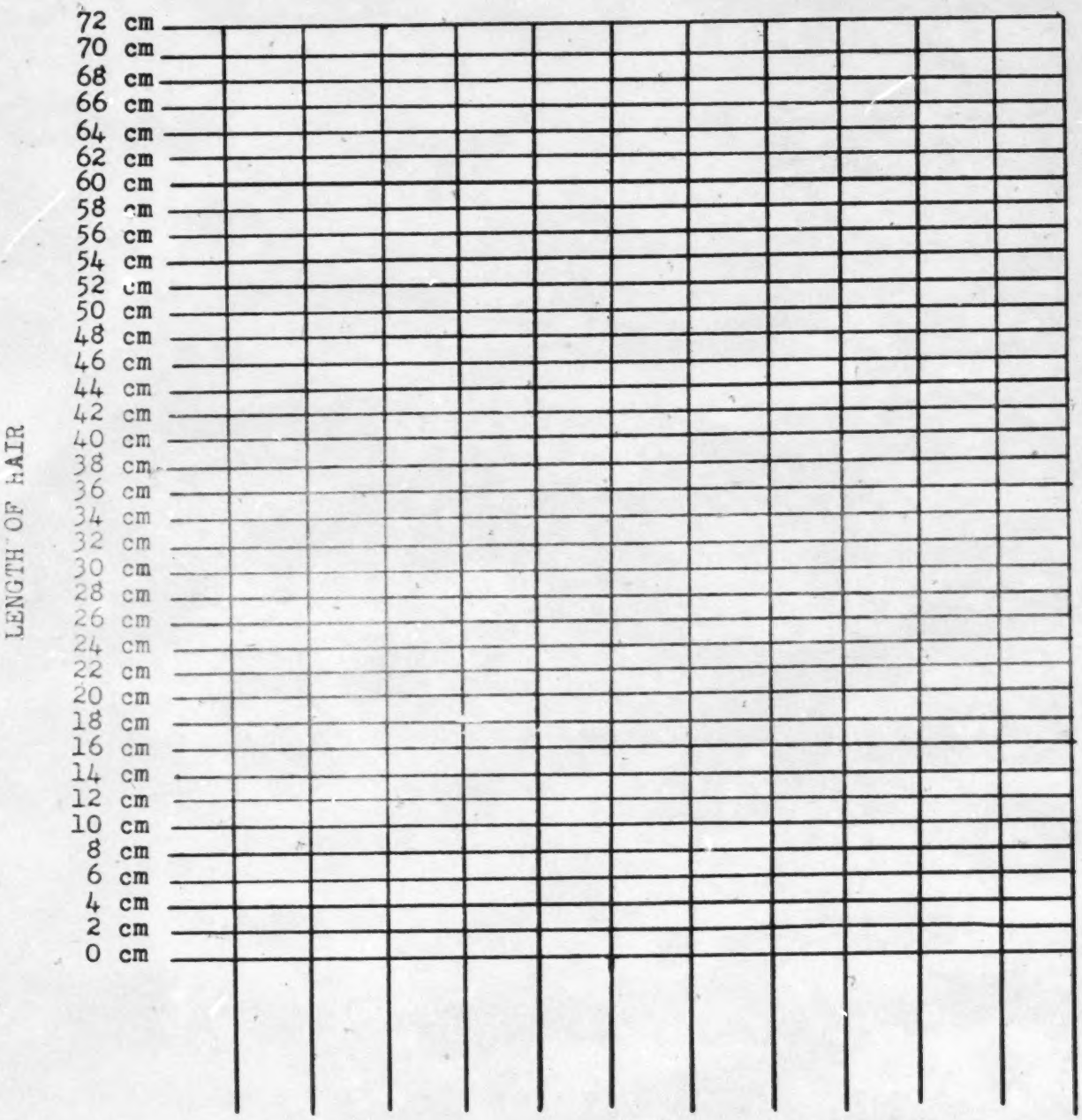
    Now arrange the circled letter in each box to answer the following statement:

    This word describes your condition if your body registered 40°C.

   More able students may wish to design their own jumbles, using metric terms, and exchange them with class members.

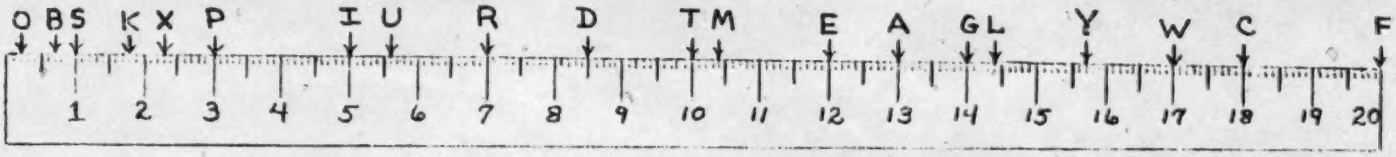
A HAIR RAISING Project

How long is your hair in centimeters? Take <u>one</u> hair and measure it to the <u>nearest</u> cm. Put your name on the chart. Then color up to the correct length. Next find 10 friends and measure the length of one of their hairs. Put their names and hair lengths on the chart.



PICKLED PUZZLE

Answer Key



Find each of these points on the ruler. Take the letter from the ruler and write it in the blank.

10 cm → T
130 mm → A
23 mm → X
5 cm → I
85 mm → D
12 cm → E
70 mm → R
104 mm → M
50 mm → I
1 cm → S
100 mm → T
10 mm → S

Read DOWN the columns.

13 cm → A
7 cm → R
120 mm → E

1 cm → S
1 dm → T
56 mm → U
20 cm → F
2 dm → F
157 mm → Y

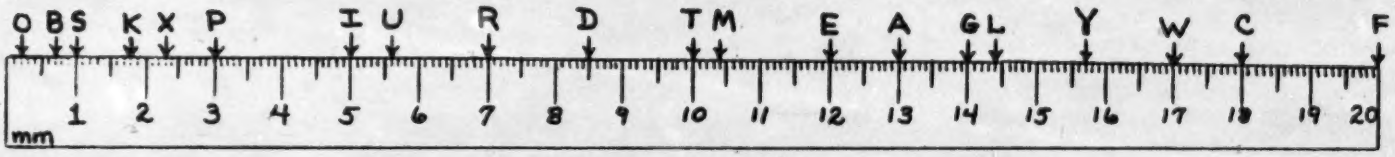
200 mm → F
2 mm → O
144 mm → L
18 mm → K
10 mm → S

CAREFUL! Some of these are dm

Taxidermists are stuffy folks.

29

PICKLED PUZZLE



Find each of these points on the ruler. Take the letter from the ruler and write it in the blank.

10 cm → T
130 mm → ___
23 mm → ___
5 cm → ___
85 mm → ___
12 cm → ___
70 mm → ___
104 mm → ___
50 mm → ___
1 cm → ___
100 mm → ___
10 mm → ___

Read DOWN the columns.

13 cm → ___
7 cm → ___
120 mm → ___

1 cm → ___
1 dm → ___
56 mm → ___
20 cm → ___
2 dm → ___
157 mm → ___

200 mm → ___
2 mm → ___
144 mm → ___
18 mm → ___
10 mm → ___

CAREFUL! Some of these are dm

SLOW GOING

Answer Key

Read each sentence and circle your answer. On the next page connect the two letters that go with your answer. The first one is done for you.

1) 3 m — (30 dm → F,C) / 300 dm → E,F

2) 5 m — (5000 mm → G,K) / 500 mm → W,E

3) 600 cm — 60 m → S,I / (6 m → W,U)

4) 20 dm — (2 m → H,S) / 200 m → R,Z

5) 14 m — 14000 dm → B,C / (140 dm → V,X)

6) 8 m — 80 cm → B,E / (800 cm → Y,Z)

7) 9000 mm — 900 m → K,R / (9 m → F,N)

8) 16 m — (1600 cm → P,L) / 160 cm → N,W

9) 30 m — 3000 dm → H,I / (300 dm → O,Q)

10) 24 m — (24000 mm → S,T) / 240 mm → E,N

11) 20 m — (2000 cm → N,V) / 200 cm → G,B

12) 410 dm — (41 m → L,M) / 4100 m → X,R

13) 10 m — (10000 mm → W,Z) / 1000 mm → Z,S

14) 1000 cm — 1 m → X,L / (10 m → J,G)

15) 27000 mm — 270 m → B,F / (27 m → C,D)

16) 1 m — (10 dm → D,H) / 1000 dm → T,I

17) 35 m — (3500 cm → T,Y) / 35000 cm → O,H

18) 12 m — 120000 mm → F,W / (12000 mm → K,X)

19) 1 m — (100 cm → J,O) / 10 cm → V,G

20) 4000 cm — 4 m → Z,I / (40 m → M,Q)

SLOW GOING

Read each sentence and circle your answer. On the next page connect the two letters that go with your answer. The first one is done for you.

1) 3 m < (30 dm → F,C) / 300 dm → E,F

2) 5 m < 5000 mm → G,K / 500 mm → W,E

3) 600 cm < 60 m → S,I / 6 m → W,U

4) 20 dm < 2 m → H,S / 200 m → R,Z

5) 14 m < 14000 dm → B,C / 140 dm → V,X

6) 8 m < 80 cm → B,E / 800 cm → Y,Z

7) 9000 mm < 900 m → K,R / 9 m → F,N

8) 16 m < 1600 cm → P,L / 160 cm → N,W

9) 30 m < 3000 dm → H,I / 300 dm → O,Q

10) 24 m < 24000 mm → S,T / 240 mm → E,N

11) 20 m < 2000 cm → N,V / 200 cm → G,B

12) 410 dm < 41 m → L,M / 4100 m → X,R

13) 10 m < 10000 mm → W,Z / 1000 mm → Z,S

14) 1000 cm < 1 m → X,L / 10 m → J,G

15) 27000 mm < 270 m → B,F / 27 m → C,D

16) 1 m < 10 dm → D,H / 1000 dm → T,I

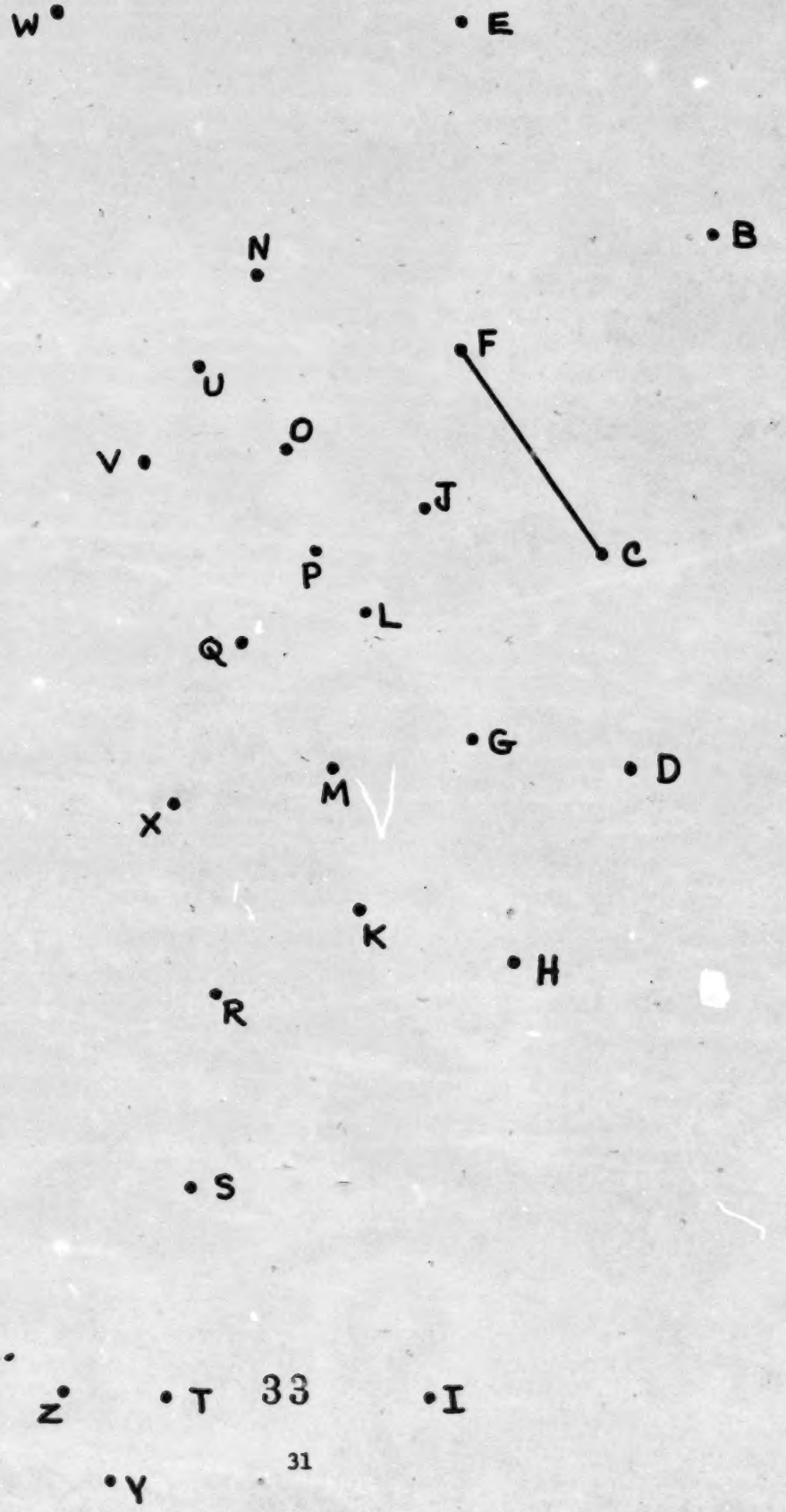
17) 35 m < 3500 cm → T,Y / 35000 cm → O,H

18) 12 m < 120000 mm → F,W / 12000 mm → K,X

19) 1 m < 100 cm → J,O / 10 cm → V,G

20) 4000 cm < 4 m → Z,I / 40 m → M,Q

32


W
E
B
N
F
U
O
V
J
C
P
L
Q
G
D
M
X
K
H
R
S
Z
T
33
I
Y

WHO, ME?

Answer Key

Fill in the blanks. Then shade in each area on the previous page which contains one or your answers.

5 cm = 50 mm

70 mm = 7 cm

14 cm = 140 mm

12 cm = 120 mm

40 mm = 4 cm

80 mm = 8 cm

9 cm = 90 mm

20 mm = 2 cm

160 mm = 16 cm

130 mm = 13 cm

15 cm = 150 mm

30 mm = 3 cm

10 mm = 1 cm

11 cm = 110 mm

30 cm = 300 mm

60 mm = 6 cm

270 mm = 27 cm

100 mm = 10 cm

20 cm = 200 mm

100 cm = 1000 mm

Fill in the blanks. Then shade in each area on the previous page which contains one or your answers.

5 cm = _____ mm

70 mm = _____ cm

_____ cm = 140 mm

12 cm = _____ mm

_____ mm = 4 cm

_____ mm = 8 cm

_____ cm = 90 mm

20 mm = 2 _____

160 mm = _____ cm

_____ mm = 13 cm

_____ cm = 150 mm

30 mm = _____ cm

_____ mm = 1 cm

_____ cm = 110 mm

30 cm = _____ mm

60 mm = _____ cm

_____ mm = 27 cm

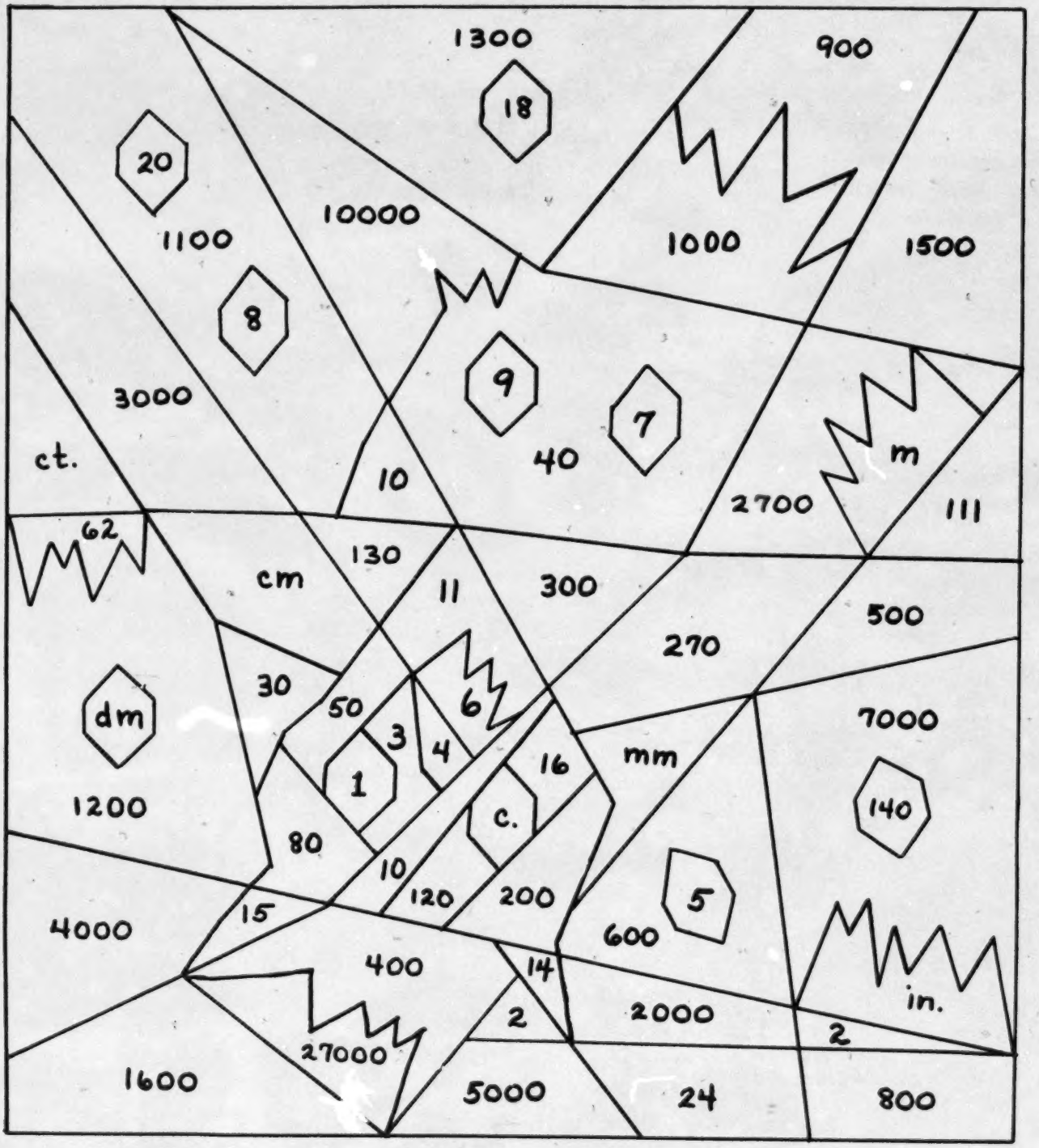
100 mm = _____ cm

20 cm = _____ mm

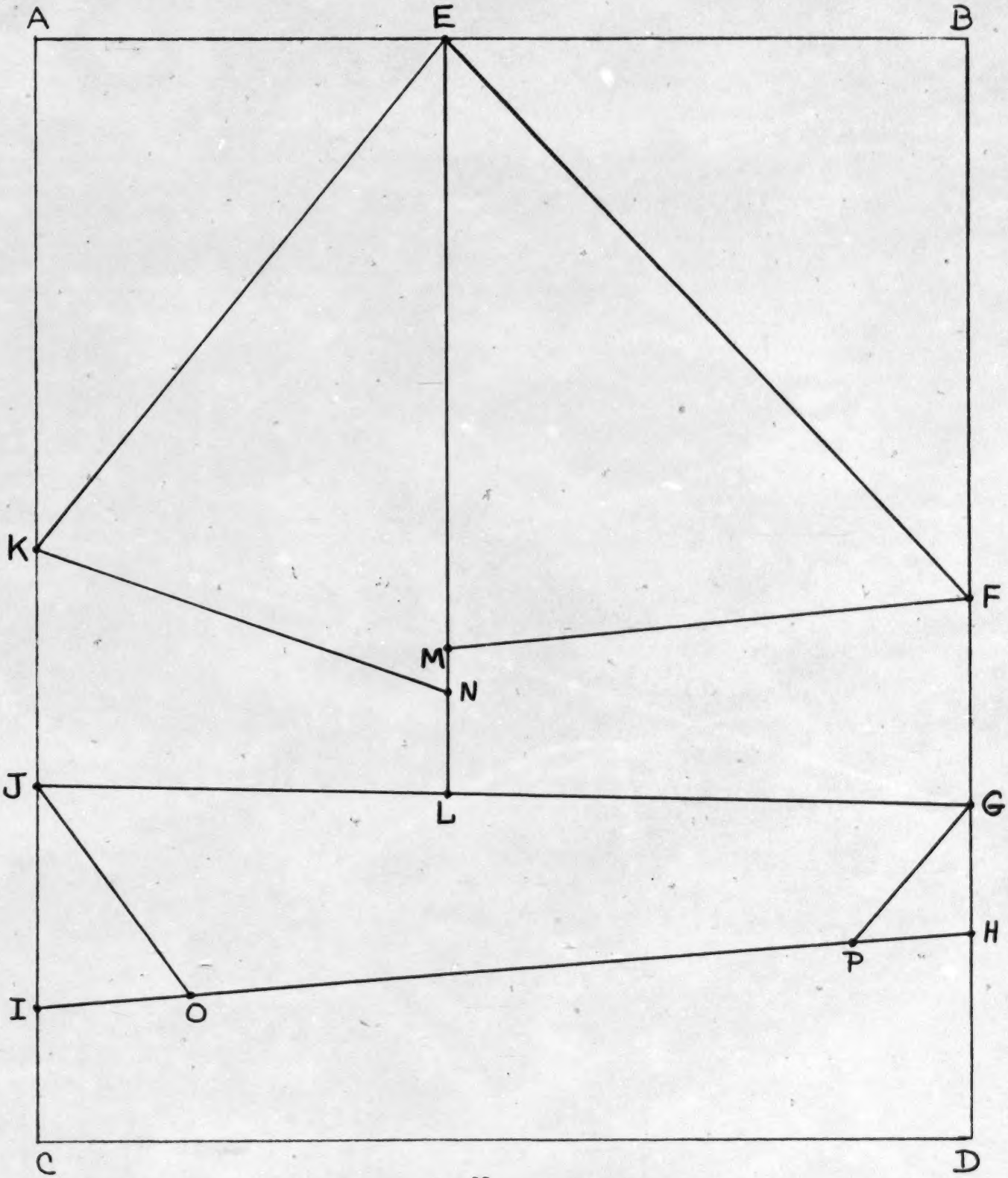
100 cm = _____ mm

WHO, ME?

The problems for this puzzle are on the next page.



Metric Main
Answer Key



Metric Main

Make a picture by measuring and drawing lines. The directions are here. The place to draw the picture is on the next page. Each time you complete a step, put an X in front of it.

☐ 1. Point E is on segment AB, 8 cm from A

☐ 2. Point F is on segment BD, 11 cm from B
Connect points E and F

☐ 3. Point G is on segment BD, 15 cm from B

☐ 4. Point H is on segment BD, 4 cm from D

☐ 5. Point I is on segment AC, 19 cm from A
Connect points H and I

☐ 6. Point J is on segment AC, 7 cm from C
Connect points J and G

☐ 7. Point K is on segment AC, 10 cm from A
Connect points E and K

☐ 8. Point L is on segment JG, 8 cm from J
Connect points E and L

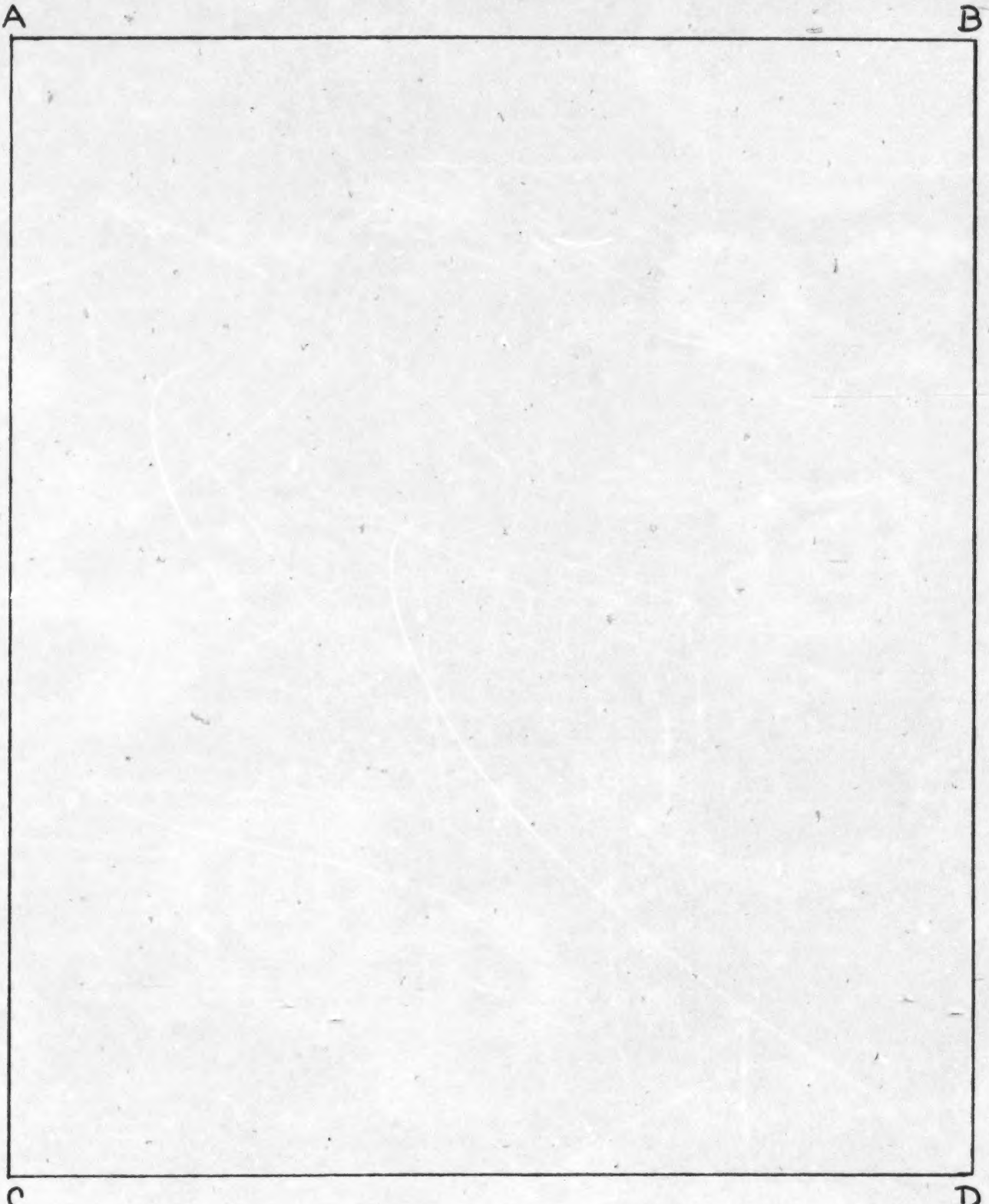
☐ 9. Point M is on segment EL, 12 cm from E
Connect points M and F

☐ 10. Point N is on segment EL, 2 cm from L
Connect points N and K

☐ 11. Point O is on segment IH, 3 cm from I
Connect points O and J

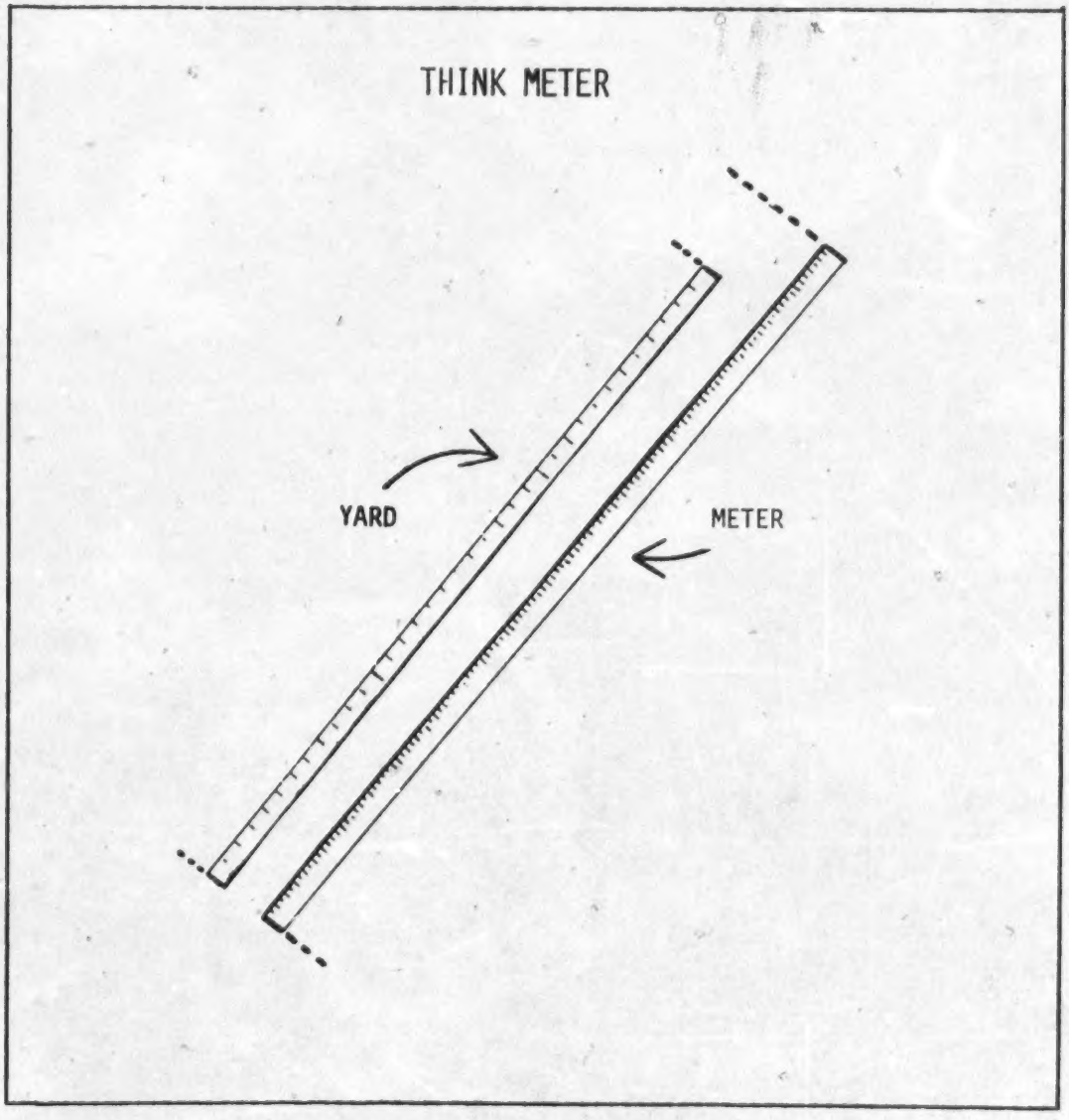
☐ 12. Point P is on segment IH, 16 cm from I
Connect points P and G

38


A
B
C
D

BULLETIN BOARD IDEA: "THINK METER"

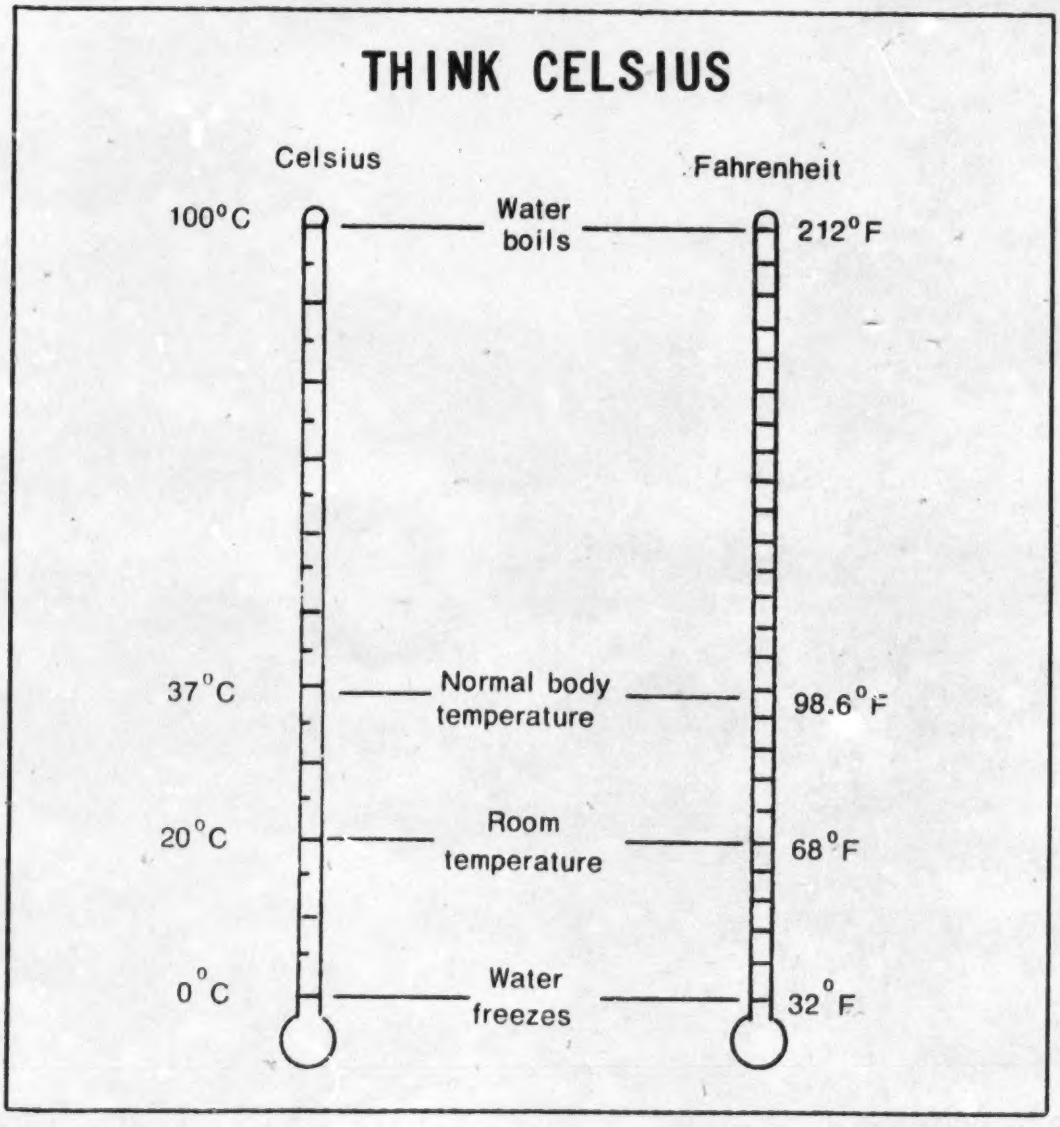
Place a meter stick next to a yard stick. Label each accordingly.



40

BULLETIN BOARD IDEA: "THINK CELSIUS"

Copy the following drawing by use of an opaque projector (or draw freehand). Label various temperatures accordingly.



PHRASES AND CLICHES GONE METRIC

TEACHING AIDS: CHALKBOARD PHRASES

While discussing the metric system, daily write a new song, phrase, or cliche on the board with metric measurements replacing the standard conventional measurements. With a conversion chart nearby, encourage the students to think of the original phrase.

"I wouldn't touch you with a 3 meter pole."

"Johnny, did you mow the back meter?"

"A miss is as good as 1.6 km"

"28.3 grams of prevention are worth 0.453 kg of cure"

"I'd walk a million kilometers for your smile."

"Give him 2.54 cm and he'll take 1 609 meters."

(song title) "155 cm, Eyes of Blue"

(birthday) "...and a pinch to grow 2.54 cm."

"More bounce to the 28.3 g"

"He wouldn't budge 2.54 cm."

"There was a crooked man and he walked a crooked .6 km."

(book/movie title) "Celsius 232"

(movie title) "96 000 km Under the Sea"

(song title) "I love you 30.4 liters and 7.6 liters."

All You Will Need to Know About Metric

(For Your Everyday Life)

10

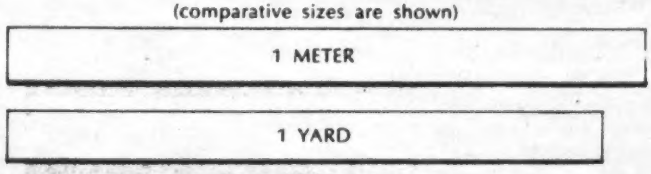
Metric is based on Decimal system

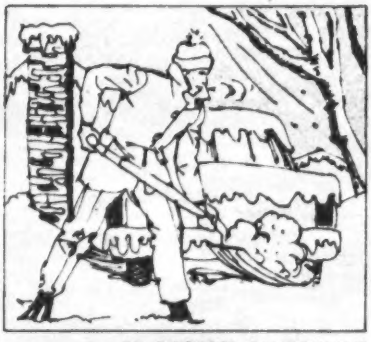
The metric system is simple to learn. For use in your everyday life you will need to know only ten units. You will also need to get used to a few new temperatures. Of course, there are other units which most persons will not need to learn. There are even some metric units with which you are already familiar: those for time and electricity are the same as you use now.

BASIC UNITS

METER: a little longer than a yard (about 1.1 yards)
LITER: a little larger than a quart (about 1.06 quarts)
GRAM: about the weight of a paper clip

(comparative sizes are shown)





25 DEGREES FAHRENHEIT

25 DEGREES CELSIUS

COMMON PREFIXES

(to be used with basic units)

Milli: one-thousandth (0.001)
Centi: one-hundredth (0.01)
Kilo: one-thousand times (1000)

For example:
1000 millimeters = 1 meter
100 centimeters = 1 meter
1000 meters = 1 kilometer

1 LITER

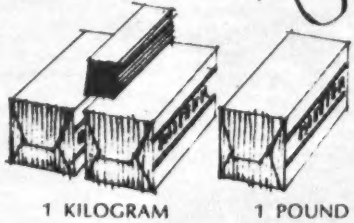
1 QUART

OTHER COMMONLY USED UNITS

Millimeter:	0.001 meter	diameter of paper clip wire
Centimeter:	0.01 meter	width of a paper clip (about 0.4 inch)
Kilometer:	1000 meters	somewhat further than ½ mile (about 0.6 mile)
Kilogram:	1000 grams	a little more than 2 pounds (about 2.2 pounds)
Milliliter:	0.001 liter	five of them make a teaspoon

OTHER USEFUL UNITS

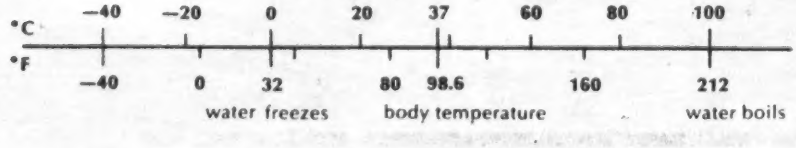
Hectare: about 2½ acres
Tonne: about one ton



1 KILOGRAM 1 POUND

TEMPERATURE

degrees Celsius are used



For more information, write to: Metric Information Office, National Bureau of Standards
Washington, D.C. 20234